IN THE SPECIFICATION

Please replace the Specification with the enclosed substitute Specification in accordance with 37 C.F.R. 1.121(b)(3). The substitute Specification contains no new matter and only clarifies the Specification by undertaking some reorganization, making grammar corrections, inserting headings and paragraph numbers, and the like. What follows is the marked up and a clean copy of the Specification in accordance with the Rule change to 37 C.F.R. 1.121 effective July 2003.

SUBSTITUTE SPECIFICATION – CLEAN VERSION

[0001] TITLE

[0002] Rim For A Bicycle Wheel With Tubeless Tire

[0003] CROSS REFERENCE TO RELATED APPLICATION(S)

[0004] This application is a continuation of U.S. Patent No. 6,588,474, filed August 2, 2001, which is incorporated by reference as if fully set forth.

[0005] FIELD OF INVENTION

[0006] The present invention relates to rims for bicycle wheels with tubeless tires.

[0007] BACKGROUND

[0008] A rim of the type specified above is, for example, illustrated in Figure 2 of the European patent application EP-A-0 790 141. In this known solution, the valve body is directly connected to the inner and outer peripheral walls of the rim. The problem with this rim, and those like it, is that they: 1) are expensive and difficult to manufacture the structure, 2) are slow to assemble the structure and tire, 3) leak air from the chamber defined between the tire and the outer peripheral wall of the rim, and, finally, 4) cannot use a standard valve body normally used for bicycle wheels with tires provided with inner tubes.

[0009] SUMMARY

[0010] With a view to overcoming the above shortcomings, the subject of the present invention is a bicycle wheel rim, comprising an inner radial wall having a first through hole; an outer radial wall having a second through hole aligned with the first through hole; side walls connecting the inner and outer radial walls together; and a removable tubular element located through the first and second

through holes. The removable tubular element comprises a tubular body having first and second ends; an outwardly extending flange located on the first end which abuts the outer radial wall proximate to the second through hole. As described, the tubular body is of a length sufficient to cause the second end to extend inwardly beyond the inner radial wall and the rim has a valve connection compatible with a valve body for a bicycle tire. Finally, the rim has a removable locking mechanism adapted to engage the removable tubular element and to detachably secure the removable tubular member in position with the inner and outer radial walls secured between the outwardly extending flange and the locking mechanism.

[0011] BRIEF DESCRIPTION OF THE DRAWING(S)

[0012] Further characteristics and advantages of the present invention will emerge from the ensuing description, with reference to the attached drawings, provided purely by way of non-limiting example, in which:

[0013] Figure 1 is a cross-sectional view of the rim according to the invention, in a plane containing the axis of the rim and in the point where the inflating valve is mounted, according to a first embodiment of the invention;

[0014] Figure 2 illustrates a first example of the second embodiment of the invention; and

[0015] Figures 3 and 4 illustrate two further examples of said second embodiment.

[0016] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0017] In the figures, corresponding parts are designated by the same reference numbers.

[0018] In Figure 1, the reference number 1 designates, as a whole, a rim for a bicycle wheel, comprising an inner peripheral wall 2, an outer peripheral wall 3, and two circumferential side walls 4, 5, which connect the two walls 2, 3 together

and extend radially outwards beyond the wall 3 in such a way as to from two ribs 6, 7 that anchor a tubeless tire (not illustrated). In the area where tire inflating valve is to be mounted, the two walls 2, 3 have two holes 8, 9 facing one another, which have a common axis in the radial direction with respect to the axis of the rim. The rim's edges are fixed to an intermediate tubular element 10 by means of welds or other bonding means S. The tubular element 10 has an end front surface, radially facing outwards and designated by 10a. The surface 10a is shaped and set flush with the external surface 3a of the outer peripheral wall 3 of the rim. In addition, the intermediate tubular element 10 has a portion 10b, which projects beyond the inner peripheral wall 2 in the direction of the axis of the rim (not illustrated) and which terminates with an end portion 10c that has an internal thread 10d. The reference number 11 designates a valve body (illustrated only schematically) of the standard type normally used for bicycle wheels with tires provided with inner tubes. The internal structure of the valve body 11 is not illustrated in so far as it is in itself known. The valve body 11 has an intermediate threaded portion 11a, which is screwed into the threaded portion 10d of the tubular element 10.

[0019] Figure 2 illustrates a second embodiment, in which the intermediate tubular element 10' is irremovably connected to the rim 1. In the case of the example of Figure 2, the intermediate tubular element 10' has a radially external end portion 10'e threaded on the outside and screwed into the internal threaded surface of a bushing 12. The ends of the bushing 12 are bonded or welded (by means of welds or other bonding means S) within the edges of the holes 8, 9. The end portion 10'e of the intermediate tubular element 10' is provided with an O-ring 13 received in a circumferential groove of said portion 10'e and pressed into contact with the internal surface of the bushing 12 to ensure tightness for preventing air from coming out of the tire chamber, which is defined between the tire itself (not shown) and the outer peripheral wall 3 of the rim. Furthermore, the intermediate tubular element 10' has a collar 10'f with an annular contact surface 10'g, which is in contact with the radially internal end surface of the bushing 12.

[0020] The embodiment illustrated in Figure 2 has a slightly more complicated structure than that of the example of Figure 1, but affords the advantage that it enables easy and fast conversion of the rim into a rim that can be used with a tire provided with an inner tube. In this case, in fact, it is sufficient to unscrew the intermediate tubular element 10' to remove it, after which the inner tube of the tire can be mounted in a conventional way, inserting the valve body associated to it through the internal passage of the bushing 12.

[0021] Figure 3 illustrates a variant of Figure 2, in which the disconnectable connection of the intermediate tubular element 10" inside the bushing 12 is obtained in a different way. In this case, in fact, the intermediate tubular element 10" has, at its radially external end, a widened head 14, which rests on the external surface 3a of the outer peripheral wall 3. In addition, the part 10"b of the intermediate tubular element 10", which projects beyond the inner peripheral wall 2, is threaded to allow screwing of a nut 15, which has the function of securing the intermediate element 10" to the rim, pulling the head 14 against the resting surface 3a. In the case of the example of Figure 3, moreover, the intermediate tubular element 10" is provided with two O-rings 13 received in respective circumferential grooves of the intermediate tubular element 10". Also the solution of Figure 3 obviously enables easy adaption of the rim to a tire provided with inner tube. The example of Figure 4 differs from that of Figure 3 mainly on account of the elimination of the bushing 12. In this case, tightness is ensured by a single O-ring 16 that is received in a front circumferential groove 17 made in the surface 3a along the edge of the hole 9. The latter solution is preferred in the case of a rim made of a composite material, for instance reinforced with carbon fiber, or in the case of a rim made of light alloy, on account of the absence of welds or other bonding means. Instead of the O-ring 16, any other sealing means may also be used, for example in the form of an adhesive. In addition, the head 14 can be shaped so as to adapt to the profile of the surface 3a in a harmonious way.

[0022] Thanks to the above-mentioned characteristics, the described rim

affords numerous advantages. First, the valve body used in the rim according to the invention may be a valve body of a standard type used for rims with tires provided with inner tubes. Second, the structure of the rim is simple and inexpensive and enables simple and fast operations both of assembly of the tire and of assembly of the valve body. Finally, when intermediate tubular element is connected in a removable way to the rim, the rim can be used with a tire provided with inner tube. In this case, it is sufficient to remove the intermediate tubular element and mount the inner tube with the corresponding valve body in the traditional way, inserting the valve body through the two holes facing one another that are made in the outer and inner peripheral walls of the rim, as well as through the aforesaid bushing in the examples of embodiment where the latter is present.

[0023] From the foregoing description it is evident that the rim according to the invention has a structure that is relatively simple and inexpensive, while at the same time being air tight inside the chamber of the tire. It further enables operations of assembly and disassembly to be carried out in a simple and rapid way, and, finally, makes possible, in the case of the aforesaid second embodiment referred to in the examples of Figures 2, 3 and 4, an easy and rapid adaptation of the rim to a tire having an inner tube.

[0024] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary widely with respect to what is described and illustrated herein purely by way of example, without thereby departing from the scope of the present invention.

* * *

ABSTRACT

A rim for a bicycle wheel with tubeless tire comprises a radially inner peripheral wall, a radially outer peripheral wall, two circumferential side walls which connect the inner and outer peripheral walls and form two ribs which extend beyond the outer peripheral wall, for anchorage of a tubeless tire. The inner and outer peripheral walls have two holes facing one another, within which an intermediate tubular element is mounted, connected to which is a valve body of a standard type normally used for bicycle wheels provided with inner tubes.